THE OCCIDENT ANT IN DAKOTA.

By Rev. H. C. McCook, D. D.

I have recently received from Prof. J. E. Todd (Professor of Natural Sciences at Tabor College, Iowa, and an Assistant on the U. S. Geological Survey), some valuable facts concerning the distribution of *Pogonomyrmex occidentalis*. While on a visit to Dakota (1882), Prof. Todd had observed a number of ant-hills which awakened his interest, and upon which he made various observations. The facts noted, together with specimens of the insects and scrapings from the mounds, were sent to me, and justify the following record :—

1. *Distribution and Site.*—The ants were seen (A. D. 1882 and 1883) on the Missouri River, south of Bismarck, opposite the mouth of the Cannon Ball River, and at a point seventy-five miles southward. Upon the extensive plain forming the bottom of the Bois Cache Creek valley, and near the sand hills and grove which give the name to the valley, the mounds are numerous. Prof. Todd thinks with some confidence that they are not located in the valley of the James River, nor in Dakota, any considerable distance east from the Missouri River. He has traveled with a team over 2500 miles in Dakota, east of the Missouri River and south of the Northern Pacific Railroad, and has not noticed the ant-hills elsewhere than the localities mentioned. In my book on "The Honey and Occident Ants,"[1] I have located this ant in southern Dakota, upon conjecture, but the above, with specimens, now give scientific confirmation.

I wish to call attention to the additional facts thus contributed in the precise line of the striking feature formerly pointed out by me in the geographical distribution of *Occidentalis*. According to Prof. Todd, the ant is confined to the bottom lands along the Missouri, and *has not pushed eastward* through the Territory. This corresponds remarkably with my conclusion, both from my own observations and those made under my direction by Dr. Horace Griffith, of Marengo, Iowa. This conclusion is that *Occidentalis* does not dwell east of the Missouri

[1] The Honey Ants and the Occident Ants, p. 124 5. J. B. Lippincott & Co., Phila.

River, in Missouri, Iowa and Minnesota; that it avoids eastern, while abounding in western Nebraska, and is not found in Kansas further east than Brookville, longitude 22° W. from Wash ton, about 97° W. Greenwich, which is nearly that of the sites reported by Prof. Todd. As Prof. Packard has reported the insect in southern Montana, we may now conclude that the entire western part of the great valley of the Missouri (west of the river and the above meridian) is inhabited by this ant and its closely allied congener, *P. barbatus*, the Agricultural Ant.

It is worthy of note that all the authentic reports which we have of the latter insect also limit its eastern distribution to about the same meridian. We have no account of it as inhabiting southern Missouri, Arkansas and Louisiana, except a note of Nuttall's in 1819, which appears to refer to one of these species. Entomologists and naturalists generally in these States might do good service by some attention to this point. It is a question of profound interest, what natural cause has operated to establish this eastern limit of distribution? The writer confesses his inability to discover any relation between the structure and economy of the ant, and the physical condition of the country, that could throw any light upon the question.

The two species very closely resemble each other, the worker forms scarcely differing except in body-size; the worker-major of *Occidentalis* corresponds almost exactly with the minor of *barbatus*. The chief differences in the sexual forms are of size and color, but also a slight difference in venation. There are, however, some marked differences in nidification and habit. The Agricultural Ant occupies the southern section of the above marked geographical district, and it seems scarcely possible to resist the inference that it is a modified form of *Occidentalis* (or *vice versa*) who inhabits the northern section. The local site of the nests in Dakota is generally a sandy flat or bottom.

2. *Nidification.*—From the observations of Prof. Todd, it further appears that the Dakota ants agree with those of Colorado in the position of the gate, at one-half to one-third the distance from the base; in the general appearance of the mounds, which are uniformly in the centre of a circular cleared area three or four feet in diameter. In size they are smaller, being about six inches high and about two feet in diameter. They are roofed in some sites with small gravel stones of quartz, but in others, as at the

mouth of the Cannon Ball River, have no such covering. Prof. Todd is inclined to think that the gravel roofing is selected from the nest vicinage and placed upon the mound; but I believe the stones to have been excavated from the underground galleries, granaries and rooms, and brought up therefrom. However, I think the construction of a roof by selection to be quite within the ability of the Occidents, as I have observed them carrying pebbles up, down and around the mound in all directions after issuing from the gate.

3. *Harvesting habit.*—Among the pebbles sent to me are a number of husks, etc., of various seeds which appear to have been taken from the kitchen-middens or refuse-heaps of the formicary. These indicate that the Dakota emmets, like the more southern examples, are harvesting ants. Mr. Thomas Meehan, to whom was referred a small quantity of the debris collected from the margin of a nest by Prof. Todd, reports that there are no seeds among the pebbles, but that there are a number of calices and undeveloped capsules of a leguminous plant, *Dalea alopecuroides*, which is common on the American plains. I was puzzled to explain why such intelligent creatures should be detected in harvesting immature seeds, until, upon inquiry, I found that leguminous plants have a succession of flowers, so that there may be mature seeds and flowers on a plant at the same time. Mr. Meehan actually found upon a specimen of the above plant in the Academy's Herbarium, both the flower and the fully developed seed; indeed, the two appear to occur upon the same spike. It is thus evident that the ants were not harvesting out of season, but were occasionally deceived, and cast out to the refuse-heaps the calices that contained no edible seed.